

MI as a Predictor of Students' Performance in Reading Competency

Karim Hajhashemi (Corresponding author)

School of Education

James Cook University, Australia

E-mail: omidhajhashemi@gmail.com

Wong Bee Eng

Department of English Language, Faculty of Modern Languages and Communication

Universiti Putra Malaysia, 43400, Serdang, Selangor, Malaysia

E-mail: bee@fbmk.upm.edu.my

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Abstract

The purpose of this study was to examine whether performance in MI could predict the performance in reading competency. The other objectives were to identify the components of MI which are correlated with the reading test scores, and to determine the relationship between the multiple intelligences and reading proficiency. A descriptive and ex post facto design was employed to ascertain relationships among the variables. The participants were 128 randomly chosen pre-university students (grade12, 18-19 years old) of both genders studying in Tehran in the academic year 2008-2009. Three instruments were utilized in this study: 1) a demographic questionnaire; 2) the Persian version of Mckenzie's MI Inventory; and 3) a standardized reading proficiency test which was selected from retrieved paper-based TOEFL® tests. Results of the correlation analysis revealed no significant relationship between the two variables of MI and reading scores of the students. Furthermore, the results of the correlation analysis revealed that there was a low significant, negative relationship between musical-rhythmic intelligence and reading which suggests that when the reading score of a student increases, musical-rhythmic intelligence of the same student decreases and vice versa. Overall, three categories of MI (musical-rhythmic, verbal-linguistic, bodily-kinesthetic) were found to be predictive of reading proficiency.

Keywords: Multiple intelligences theory, Reading proficiency, EFL pre-university students

1. Introduction

Traditionally intelligence is defined in terms of intelligence quotient (IQ) which designates the ratio between mental age and chronological age. In this view, the abilities of the individuals are measured via their verbal-linguistic and logical-mathematical intelligences while the other intelligences (e.g. musical-rhythmic, interpersonal, and visual-spatial intelligences) are not considered. Along with such a one-dimensional view of assessing the people's minds, comes a corresponding view of school which is called "uniform view" (Gardner, 1993, p. 6, 2006a, p. 48). Gardner considers the "uniform school" as the ones having a core curriculum, "a set of facts that all the individuals should know and very few electives" (1993, p. 6, 2006a, p. 48). In these schools, the better students (those with higher IQs) are allowed to take courses that invoke critical reading, calculation and thinking skills and are the consumers of paper and pencil instruments such as IQ tests or SAT (the Scholastic Aptitude Test) accordingly. According to the results of such tests, the individuals will be ranked and the best and the brightest ones get into the better colleges.

Gardner (1993, p. 6, 2006a, p. 48) also claims that there is no question that this approach works well for certain people. Accordingly he mentions that there is another vision which is based on a radically different view of the mind and yields a very different view of school. Therefore, he introduces a pluralistic view of mind which can recognize different facets of cognition and acknowledging the people who have different cognitive strengths and contrastive cognitive styles. He then moves further and introduces the concept of an individual-centered school which takes such a multifaceted view of intelligence seriously. The models of these schools are based in part on the finding from cognitive science and neuro-science. Since then, Gardner calls this approach the theory of MI. To Gardner, intelligence is "the ability to solve problems or to fashion products that are valued in one or more cultural settings"

(1993, p. 15, 2006a, p. 48).

Thus, the traditional view of intelligence which includes verbal-linguistic and logical-mathematical intelligences is expanded into the theory of MI. According to the theory of MI, all human beings possess at least nine different intelligences which are the initial representative of different ways of our learning (Gardner, 1983). He further argues that all human beings possess a number of discrete intelligences which manifest themselves in different skills and abilities. These intelligences are applied by all human beings to solve problems, invent processes, and, create things. Gardner (1983, pp. 62-67) used eight criteria to identify the seven types of intelligence:

- potential isolation by brain damage,
- the existence of idiot savants, prodigies, and other exceptional individuals,
- an identifiable core operation or set of operations,
- a distinctive developmental history, along with a definable set of expert end-state performances,
- support from psychometric findings,
- an evolutionary history and evolutionary plausibility,
- susceptibility to encoding in a symbol system, and
- support from experimental psychological tasks.

Using these criteria, Gardner (1983) proposed his initial list of seven intelligences and since then added two more to the list (1995, 1999a, 1999b). To Gardner, the classification of the nine intelligences is a preliminary list and each form of intelligence can be subdivided, or the list can be rearranged. His MI classification is verbal-linguistic, logical-mathematical, visual-spatial, bodily-kinesthetic, musical-rhythmic, interpersonal, intrapersonal, naturalist, and existential. Giles et al. (2003) believe that the intelligences introduced by Gardner enable the individual's ability to "solve problems, create products or provide services that are valued within a culture or society". To Gardner, the purpose of school should be "to develop intelligences and to help people reach vocational and avocational goals which are appropriate to their particular spectrum of intelligences" (1993, p. 9, 2006a, p. 50). Therefore, people would feel more engaged, competent, and more inclined to serve the society in a constructive way. Hence, he proposes two assumptions to designate his ideal school of the future; that is not all people have the same interests and abilities; not all of us learn in the same way, and nowadays no one person can learn everything there is to learn (1993, p. 11). Various types of intelligence are briefly described in the following.

Verbal-linguistic intelligence- this intelligence involves the ability to use language in an effective and innovative way. Weber (2005, p. 4) defines verbal-linguistic intelligence as speaking, poetic or journalistic ability, sensitivity to the sounds, rhythms, and meanings of words, as well as understanding different functions of language. This kind of ability exhibits itself in its fullest form by poets (Gardner, 1993, p. 8).

Logical-mathematical intelligence- it refers to the logical, mathematical and also the scientific ability of a person. Such ability consists of discovering models and deductive reasoning as well as thinking rationally. It also means showing great strength in solving problems.

Visual-spatial intelligence- visual-spatial intelligence involves the ability to form mental models of the world and the ability to perceive the visual-spatial world accurately. Visual-spatial intelligence is defined by Gardner (1983) as the ability to perceive a form or an object which can be developed even in individuals who are blind and have no direct access to the visual world.

Musical-rhythmic intelligence- Weber (2005, p. 4) defines this intelligence as the ability to compose music and play an instrument; the ability to produce and appreciate rhythm, pitch, and timbre; and the appreciation of various forms of musical expressiveness. Those who have a good ear for music can be considered to have this intelligence.

Bodily-kinesthetic intelligence- this intelligence includes the ability to dance and engage in athletics, the ability to control one's body movements, and the ability to handle objects skillfully (Weber, 2005, p. 4). Gardner (1983, p. 206) considers this intelligence as the ability to use one's body in highly differentiated and skilled ways, for expressive as well as goal-directed purposes. Those who have a well-coordinated body are good at this intelligence.

Interpersonal intelligence- according to Gardner (1993, p. 9), this intelligence is the ability to understand other people: what motivates them, how they work and how to work cooperatively with them. Those who have the ability to work well with others are good in this way.

Intrapersonal intelligence- it entails the ability to understand and construct an accurate perception of one-self and apply one's talent in a successful way, which leads to happy and well-adjusted people in all areas of life (Richards & Rodgers, 2001, p. 116).

Naturalist intelligence-Naturalist intelligence, added to the list in 1995, is the ability to understand nature and draw on patterns and design and categorize them in order to solve real-world problems. Evidence for such intelligence among those with it is their ability to observe, understand, and organize the patterns which can be found in nature. These people enjoy spending much time outdoors.

Existential intelligence- Gardner added existential intelligence to his earlier list of eight in 1999. As such, this form of intelligence is still under consideration (see e.g. Armstrong, 2009; Gardner, 1999a, 1999b, 2006b; Nevin, Villa, & Thousand, 2009; Viens & Kallenbach, 2004). Existential intelligence is introduced as the intelligence of understanding in a large context or big picture. This intelligence seeks connections to real world understandings and applications of new learning. Therefore, people who question the meaning of the life are in this camp.

2. The Relationship between Reading and Multiple Intelligences

Reading which is the most complex form of information processing is a cognitive process, centered in the brain and involves processes that the brain utilizes in mental activities such as paying attention to something, remembering a number, and forgetting an important call (Koda & Zehler, 2008 ; Millar, 1997; Taylor, Harris, Pearson, & Garcia, 1995; Wood & Taylor, 2006). It is regarded as a language process that is closely linked to other language processes (speaking, writing, and listening) that we acquire. Reading is a human trait that schools of psychology try to elaborate on its nature and justify its theoretical stand (Koda & Zehler, 2008). The theory of MI has addressed issues of reading as their crucial concern (Armstrong, 2003; Safi, 1996). However, reading is treated both as a skill and as knowledge across the literature. Researchers in MI have been specially engaged in reading to scientifically elaborate on its cognitive aspects (Alarcón & DeFries, 1997; Brooks, Fulker, & DeFries, 1990; W. Johnson, Bouchard, Segal, & Samuels, 2005).

Cognitive abilities are the reader's characteristics that influence his/her reading comprehension. Since the performance of readers with normal cognitive abilities differs slightly, some scholars have related reading to thinking. For example, Goodman (cited in Sadeghi, 2008) believes that efficient reading results from the interaction between language and thought while some emphasize on the effect of cognitive strategies and meta-cognitive knowledge on reading comprehension (A. P. Johnson, 1998; Schoonen, Hulstijn, & Bossers, 1998).

Reading is also compared to 'a detective act' in which the reader uses his/her cognitive ability in connecting all the relevant information to solve the problem (Sadeghi, 2008). Hence, it can be implied that the reader's comprehension can be affected by his/her cognitive abilities including intelligence. Accordingly, Taylor et al. (1995, p. 4) state that reading is centered in the brain involving the whole processes that the brain uses in mental activities (e.g. we perceive, forget, remember, and so on).

Walker (2004) moves further by saying that "embodied within this text is the strong belief that our strengths lie in our individual differences" (p. vi). Thus, she mentions that there is a need to nurture these individual differences within the instructional programs which should be built on the students' unique strengths. It is also recommended to use these strengths in order to expand the conceptual knowledge of the students and create intelligent citizens (Walker, 2004, p. vi). In this regard, Moallem (2002; cited in Brunton, et al., 2006) suggests that considering the learning styles of each individual and matching them with teaching or instructional style will help the information be kept longer and make its application more effective. Further, Moallem mentions that such students have "more positive attitudes towards the subject of the course than those who are subjected to clashes in teaching/learning styles".

As a teacher what we know and what we do in the classroom should have significant influence on the thoughts, achievement and behaviors of the students. Thus, the "teachers must help students use their combination of intelligences to learn whatever it is they want to learn, as well as what the teachers and society believe they have to learn" (Finvoc, 2003; cited in Brunton, et al., 2006). The students who are "aware of their most productive mode of learning meet with greater success in both education and in the workforce than those people who attempt to learn and work through a mode with which they are incompatible" (Brunton, et al., 2006). Thus, aiding the students to be self-aware can be facilitated by investigating their prior learning, their learning styles and their multiple intelligences strengths.

The cognitive competence of the human being is better described in the MI theory in terms of a set of abilities, talents or mental skills which are called intelligences. The MI theory provides a framework of the students' dominant styles, preferences and areas of talents. Such knowledge can be used in enhancing the experience of the learners toward the goal of higher proficiency. By raising students' awareness of their preferred cognitive modality, the teacher is raising their interest in learning and helping them gain understanding of what method suits them best. It is important that students are aware of their weaknesses as well as their strengths. Understanding where effort needs to be put in is also essential. The ability to control the individual's cognitive processes has been linked to

intelligence. For example, Sternberg (cited in Brunton, et al., 2006) calls these processes as being responsible for “figuring out how to do a particular task or set of tasks and then making sure that the task or set of tasks are done correctly”.

Since pre-university students in Iran have to pass a one-year course and achieve the Certificate to be qualified to sit for the highly competitive National Entrance Exam (Konkur) and gain a place at university, they are under enormous pressure and have to read a lot of subjects. Different types of texts require different ways of reading and so require different sets of practices. This differentiation challenges the general notion of ‘reading ability’ associated with test scores used to identify students as ‘proficient’ or ‘struggling’ readers (Bryant, et al., 2000; Charl Nel & Kopper, 2004; Tankersley, 2003; Valencia & Buly, 2004; Vaughn, et al., 2008). Due to the influence of the Konkur on the future job prospects of students, teachers usually teach students to pass the test. Thus, they concentrate on the skills required for the test. Based on the studies done in Iranian EFL setting (e.g., Golsorkhi, 2008 [cited in Ghorbani, 2008]; S. M. H. Hosseini, 2007; Jahangard, 2007; Kamyab, 2008; Rahimi, Riazi, & Saif, 2008), the focus of teachers is merely on the reading skill and they try to improve this skill among the students at the expense of other skills (listening, writing, and speaking). For example, Jahangard (2007) and Hosseini (2007), state that the Iranian EFL learners’ aural and oral skills are not considered and emphasized properly in textbooks and learners lack listening and speaking activities as they are not demanded in the Konkur or the final examinations. In fact, the Konkur is a paper and pencil test that focuses on reading and ignores other skills. In addition, the items are multiple-choice in nature.

Consequently, topics and skills in English textbooks are aimed at enhancing students’ reading ability. Achieving an acceptable level of reading proficiency in English is the main aim of the students. Thus, it is justified that the skill focused on is the reading skill. And pre-university students were selected for this study because very few such studies have investigated this group of learners.

This study may provide an initial view of the nature and quality of the students’ multiple intelligences and how they are related to the students’ reading scores. Thus, the results can be used to make recommendations that may serve to make educators aware of ways to modify instruction and offer a variety of opportunities for learners in the classroom. Gardner (1993) states, “only if we expand and reformulate our view of what counts as human intellect will we be able to devise more appropriate ways of assessing it and more effective ways of educating it” (p. 4). Understanding the types of intelligence and their impact on learners can greatly assist educators, teachers, trainers, and instructional designers in their development and implementation of learning materials.

To the researcher’s knowledge, no considerable research has been conducted on this topic in Iran. It is hoped that the results of this study might provide EFL teachers with insights into how learners actually learn in a classroom setting. The findings and recommendations can also provide teachers with further insights into factors involved in determining a MI profile of the Iranian EFL pre-university learners.

3. Aim of the Study

The purpose of this study is to examine whether performance in MI could predict the performance in reading competency. The other objectives are to identify the components of MI which are correlated with the reading test scores of the participants, and to determine the relationship between the multiple intelligences and reading proficiency. The study sought to answer two research questions which are reproduced here for convenience:

1. With regard to multiple intelligences and reading proficiency:
 - (a) Is there any relationship between multiple intelligences and reading proficiency of Iranian EFL pre-university students?
 - (b) Which components of multiple intelligences are correlated with the scores of the standardized reading proficiency test among Iranian EFL pre-university students?
2. Are the scores on multiple intelligences a good predictor of students’ performance in a standardized reading proficiency test?

4. Methodology

A descriptive and ex post facto (also called causal-comparative) design was employed to ascertain relationships among the naturally occurring variables. Gall et al. (2003) suggested a causal-comparative design when natural categories have been influenced by existing variables. Ary et al. (2009) also suggest that “when an investigation involves attribute independent variables that the researcher cannot manipulate, he or she must turn to ex post facto research” (2009, p. 332). According to Ary et al. (2009), the two basic modes of ex post facto research are (1) to begin with subjects who differ on an independent variable (cause) and try to determine the consequences (effect) of

these differences, and (2) to begin with subjects who differ on a dependent variable (effect) and try to determine the antecedents (cause) of this difference. Since the MI differs among the students and is a characteristic that the subjects have before the study begins, we are going to use the former.

4.1 Participants

The participants for this study were 128 pre-university students (grade 12, 18-19 years old) of both genders (54 males, 74 females) studying in Tehran in the academic year 2008-2009. According to Ary et al. (2009, pp. 157-158), it is not necessary to study a large number of samples in order to understand the phenomenon under consideration.

The most important characteristic of a sample is its representativeness of the population under study, not its size and the representativeness should be kept as the major goal in selecting the samples. Sekaran and Bougie (2009) also suggests that "the more representative of the population the sample is, the more generalizable are the findings of the research" (p. 266). In this regard, the region was initially selected randomly among different regions of Tehran Education Organization; then the students were chosen randomly from 2 different high schools in that region.

4.2 Instrument

The instrument utilized in the present study consisted of three parts: 1) a demographic questionnaire- to elicit the participants' background information on their academic level, age, gender, education field, and years of studying English; 2) the Persian version of MI Inventory- in this study, McKenzie's (1999) questionnaire was used. It presents 90 statements related to each of the nine intelligences proposed by Gardner (1999a, 1999b). The Persian version of the MI Inventory was used in this study (Hajhashemi & Wong, 2010); and 3) a standardized reading proficiency test which was selected from retrieved paper-based TOEFL® tests. The reading comprehension test consisted of five short passages, each accompanied by 9 to 11 multiple-choice questions. In total, 50 questions were answered in 55 minutes by each participant.

4.3 Data Collection Procedure

Data collection took place during the summer semester 2008-2009. The process of data collection was done in two sessions. On the day of data collection, the students were informed about the importance of their role in answering the questions and their cooperation to follow the detailed instructions. In the first session, both the demographic and the MI questionnaires were administered which took around 40 minutes. The reading comprehension test was given to the students one week later and was completed in about 55 minutes.

To assess the students' MI profile, McKenzie's MI Inventory was distributed. According to the number of statements marked by the students, an MI profile for each student was prepared. These profiles represent the strength and weakness of the students regarding the nine intelligences. The raw scores of the questionnaire were subjected to descriptive analysis and the results are shown in Table 1. Based on the results indicated in Table 1, the students are strong on intrapersonal intelligence ($M=42.41$ out of 50) and weak in interpersonal intelligence ($M=34.96$). Two other intelligences which seem to be most highly developed in the Iranian EFL pre-university students are existential ($M=40.95$) and musical-rhythmic ($M=40.73$) intelligences.

[Insert Table 1 Here]

The respondents' language proficiency was also evaluated by a TOEFL® reading test (see Table 2). As shown in Table 2, out of the total of 50 marks, the range of the scores is from a minimum of 1 to a maximum of 21. The mean score for the reading proficiency test is $M=10.54$ and the standard deviation is $SD=5.46$. Based on the mean score and the lowest score obtained by the respondents, it can be seen that they performed rather poorly in the reading comprehension test. The lowest score is 1. On average, they only managed to score 10.54 for the test which shows that all of them managed to score less than half of the total marks. Grabe (1991) states that such an observed poor performance could be due to the difficulty faced by them in answering the standardized reading test, since academic texts are difficult. Additionally, text level processes, as required for a higher level of text processing, require additional amount of working memory resources compared with word and sentence level processes (Calvo & Carreiras, 1993; Daneman & Carpenter, 1980). Therefore, there is probability that the respondents faced difficulties in the processing the texts as academic tests need a higher level of language ability and thinking skills (McWorther, 1987; Tankersley, 2003).

[Insert Table 2 Here]

According to Ellis (1994), low proficiency may be due to different factors such as beliefs, affective state, learning styles, aptitude, personality and motivation. Green and Oxford (1995) also state that,

it is important to emphasize that in characterizing some students as less successful we are implying no judgment of their potential as learners, but are merely referring to the fact that at the time of our study they had not been

successful learners of English, for any of a number of possible reasons. (p. 269)

5. Results and Discussions

Two research questions were proposed in this study that are addressed in the following.

5.1 Research Question No. 1

The first research question in this study includes two parts. The first part attempts to determine the relationship between multiple intelligences and reading proficiency of Iranian EFL students. Since cognitive abilities are one of the characteristics that influence the readers' reading comprehension and the performance of readers with normal cognitive abilities differs slightly, some scholars have related reading to thinking (e.g., Goodman, 1970; cited in Sadeghi, 2008). Moreover, reading is compared to 'a detective act' in which the reader uses his/her cognitive ability in connecting all the relevant information to solve the problem (Rumelhart, 1984, p. 19). Hence, it can be implied that the reader's comprehension can be affected by his/her cognitive abilities including intelligence. So, in an attempt to answer this research question, a Pearson correlation was conducted between the overall MI score of the students and their reading proficiency score to find out the strength and direction of the linear relationship between the two variables. For this purpose, the score of the nine categories of MI were added together and then divided by nine, to have an overall MI score. After that the correlation between the overall MI and reading scores was calculated, using SPSS version 17. The results are shown in Table 3.

[Insert Table 3 Here]

In Table 3, the result of Pearson product moment correlation, reveals that the correlation between the MI and reading is $r = -.055$, $n = 128$, $p > .05$. The correlation coefficient r shows no significant relationship between the two variables of MI and reading score. According to Guilford's rule of the thumb (Guilford & Furchter, 1978), there is a very high correlation with a very high dependable relationship between variables when correlation coefficient (r value) is more than .90; there is a high correlation with a marked relationship when correlation coefficient is between .70-.90; there is a moderate relationship with a substantial relationship when correlation coefficient is between .40-.70; and there is a low correlation with a definite but small relationship between variables when correlation coefficient is between .20-.40; and when the correlation coefficient is less than .20, there is little or negligible relationship between the variables. Based on Guilford's rule of the thumb, the relationship of MI and reading scores in the present study ($r < .20$) is negligible.

While some studies (Akbari & Hosseini, 2008; Pasha Sharifi, 2008; Pish Ghadam & Moafian, 2008) found that there is a significant relationship between MI and language proficiency, the result for this study is congruent with recent studies by Razmjoo (2008) and Motallebzadeh and Manouchehri (2009) who have reported that there is no significant relationship between language proficiency and intelligences. For example, in their study, Motallebzadeh and Manouchehri (2009) discovered that there is no relationship between IELTS' reading scores and multiple intelligences.

Furthermore, the second part of this research question is to identify the components of MI which are correlated with the score of reading proficiency test of Iranian EFL students. To attain this research question, another Pearson product moment correlation was carried out between the reading score of the individuals and each type of intelligence. The results are shown in Table 4.

[Insert Table 4 Here]

As shown in Table 4, the results of Pearson coefficient determination analysis imply that there was only one category of MI, musical-rhythmic intelligence, which provided significant contribution for the total variation in the students' reading proficiency. There are negative relationship between musical-rhythmic intelligence and reading but according to Guilford's rule of the thumb, there is a low significant inverse relationship between reading score and musical-rhythmic intelligence ($r = -.227$, $n = 128$, $p < .05$) which suggests that when reading score of a student increases, musical-rhythmic intelligence of the same student decreases and vice versa. This shows that the low proficiency EFL learners' reading comprehension performance is related to the musical-rhythmic intelligence.

The findings of the present study (as shown in Table 4) agree with Yeganehfar (2005) who reported a significant correlation between reading and musical-rhythmic intelligence. Thus, the findings of the study are contrary to the previous studies (Motallebzadeh & Manouchehri, 2009; Razmjoo, 2008). Previous research (Motallebzadeh & Manouchehri, 2009) has shown that only logical-mathematical intelligence revealed a significant relationship with reading comprehension and there was no significant relationship with reading and other types of intelligence. In his study, Razmjoo(2008) reported that there is no significant relationship among the types of intelligence and language proficiency.

5.2 Research Question No. 2

The second research question of the present study was to find the intelligence type that is the best predictor of learner's performance in reading proficiency test. To answer this question, a stepwise multiple regression analysis was performed on the data with reading score as a criterion variable and the nine categories of MI as predictor variables. The results of this statistical analysis are presented in Table 5.

[Insert Table 5 Here]

Considering the regression results for the whole sample as presented in Table 5, it can be seen that there were three categories of MI that seemed to be predictive of reading proficiency. Those significant predictor variables were musical-rhythmic, verbal-linguistic and bodily-kinesthetic intelligences. The best predictor chosen by the statistic regression program was musical-rhythmic intelligence which yielded a multiple regression coefficient (R) of .23. The coefficient of determination R^2 of musical-rhythmic intelligence showed that this variable by itself contributed 5.2% of the variance in reading proficiency. The second predictor chosen by the statistic program was verbal-linguistic intelligence. It was chosen on the basis that it improved the prediction achieved by the first factor, musical-rhythmic intelligence, where the combination of musical-rhythmic and verbal-linguistic intelligences produced a multiple correlation coefficient of .29. The coefficient of determination R^2 of musical-rhythmic and verbal-linguistic intelligence showed that these variables contributed 8.4% of the variance in reading proficiency. Stepwise multiple regression analysis continued with the next selection of variable. The statistic program picked up bodily-kinesthetic intelligence as the third predictor of reading proficiency. With the third predictor, the value of R increased to .37. The coefficient of determination R^2 of the variables (musical-rhythmic, verbal-linguistic, and bodily-kinesthetic) showed that these variables contributed 13.5% of the variance in reading proficiency. The equation of fit model for this relationship is:

$Y = \beta_1(X_1) + \beta_2(X_2) + \beta_3(X_3)$, where, Y = dependent variable, X = independent variables, X_1 = musical-rhythmic intelligence, X_2 = verbal-linguistic intelligence, X_3 = bodily-kinesthetic intelligence

When an independent variable gives out a high beta coefficient, it indicates that the variable is highly important in contributing to the prediction of the criterion variable. Based on the values reported in the table, the highest beta coefficient was -.34 which derived from musical-rhythmic intelligence. This means that musical-rhythmic intelligence was the strongest contribution to the overall equation. This variable was followed by verbal-linguistic intelligence (Beta=.33). Bodily-kinesthetic intelligence has the lowest effect with a beta coefficient of -.26 as compared to the other two predictors. To conclude, the multiple regression model for reading proficiency in standard scores units was as follows:

$Y = -.34(\text{musical-rhythmic}) + .33(\text{verbal-linguistic}) - .26(\text{bodily-kinesthetic})$

This model suggests that reading proficiency of the students could be significantly enhanced by improving the musical-rhythmic, verbal-linguistic, and bodily-kinesthetic intelligences. The present findings as shown in Table 5 were quite similar to that of an earlier study by Hashemi (2007). In her study, she collected data from 122 Iranian students and reported that bodily-kinesthetic and verbal-linguistic intelligences make the greatest contribution toward predicting reading score. The present findings are contrary to previous studies by Akbari and Hosseini (2008), Hosseini (2003), Mahdavy (2008), and Razmjoo (2008) which have reported different findings. In his study, Razmjoo (2008) mentioned that none of the intelligence types can predict the language proficiency of the EFL Iranians. Another study by Mahdavy (2008) has reported that TOEFL and IELTS scores can be predicted by verbal-linguistic intelligence. Akbari and Hosseini (2008) and Hosseini (2003) have also found verbal-linguistic intelligence as a good predictor of students' language proficiency.

6. Conclusion

In this study, the major direction was to examine the relationship between multiple intelligences and reading proficiency of Iranian pre-university students. Thus, an ex post facto design was employed to ascertain relationships among the naturally occurring variables. No significant relationship was found between the two variables of MI and reading score. Based on Guilford's rule of the thumb, the relationship of MI and reading scores in the present study was found to be negligible ($r = -.055$). Furthermore, it was revealed that there was a low significant, negative relationship between musical-rhythmic intelligence and reading ($r = -.227$) which suggests that when reading score of a student increases, musical-rhythmic intelligence of the same student decreases and vice versa. This finding showed that the low proficiency EFL learners' reading comprehension performance is related to the musical-rhythmic intelligence. Moreover, three categories of MI were found to be predictive of reading proficiency. Those significant predictor variables were musical-rhythmic, verbal-linguistic, and bodily-kinesthetic intelligences. These three variables contributed to 13.5% of the variance in reading proficiency.

Since the study has focused on reading, other skills (speaking, listening, and writing) will be open for further investigation. Therefore, it is suggested that more studies can be conducted in relation to MI and different language skills. Although, the study investigated the relationship between MI and reading with only 128 pre-university students, in fact, there are so many EFL pre-university students throughout the country. To the researcher's knowledge, no research has been conducted on this topic among pre-university students in Iran. In relation to this fact, it is posited here that, in the local context, more studies can be conducted in different parts of the country to ascertain if the trends appeared in this study are specific to the surveyed high schools or can be considered consistent throughout the country. The influence of other factors like culture, educational discipline, academic level, personality, and other psychological, socio-psychological, and cognitive factors on the relationship between multiple intelligences and language skills (listening, speaking, reading, and writing) needs to be studied further.

The present research was done utilizing the ex post facto design. The major problem in this research design is with the natural categories that are influenced by the existing variables (Gall, et al., 2003). Thus, the investigation involves the independent variables that cannot be manipulated by the researcher. Future research can take advantage of utilizing different methodological approaches. For instance, it would be beneficial if future research use a larger sample of participants from a predetermined population who could be randomly assigned into separate groups (experimental and control groups) in an experimental design.

Moreover, since TOEFL® reading tests were utilized for measuring the proficiency of the respondents, it can be argued that the results might be different if other reading proficiency tests were administered. Campbell et al. (1992; cited in Lazear, 2004, p. 141) state that assessing learning should be taken place in natural contexts, familiar environments, and with tools and activities that enable students to demonstrate their knowledge more effectively than through decontextualized, standardized approaches. Thus, it would be beneficial if future research use other sources to obtain information about the learners' reading proficiency as TOEFL seemed difficult for the students at that level.

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Table 1. Descriptive Statistics of the MI profiles of the individuals ($N=128$)

Intelligences	Minimum	Maximum	Mean	S.D.
Intrapersonal	30.00	50.00	42.41	3.95
Existential	32.00	48.00	40.95	3.64
Musical-rhythmic	28.00	50.00	40.73	5.86
Naturalist	30.00	50.00	39.72	4.77
Visual-spatial	30.00	50.00	39.52	4.55
Bodily-kinesthetic	28.00	49.00	38.95	5.09
Logical-mathematical	27.00	50.00	38.33	4.62
Verbal-linguistic	24.00	50.00	37.04	5.29
Interpersonal	22.00	45.00	34.96	4.72

Table 2. Descriptive statistics of TOEFL® Reading test

Test	<i>N</i>	Minimum	Maximum	Mean	S.D.
Reading	128	1.00	21.00	10.54	5.46

Table 3. Pearson Product-Moment Correlation between MI profiles of the Students and their Reading scores

	Reading
MI	-.055

$N=128$, *Sig.* (2-tailed) = .538

Table 4. Pearson Product-Moment Correlation between MI categories and Reading scores ($N=128$)

Intelligences	Reading	
	<i>r</i>	<i>p</i>
Naturalist	-.063	.480
Musical-rhythmic	-.227**	.010
Logical-mathematical	-.091	.308
Existential	.162	.067
Interpersonal	.081	.366
Bodily-kinesthetic	-.130	.145
Verbal-linguistic	.076	.363
Intrapersonal	.016	.857
Visual-spatial	-0.62	.486

** . Correlation is significant at the 0.01 level (2-tailed).

Table 5. Stepwise multiple regression for MI and Reading Scores of the Respondents

Model	<i>Standardized Coefficients</i> <i>Beta</i>	<i>T</i>	<i>p</i>	<i>R</i>	<i>R</i>²	Adjusted <i>R</i>²	Std. Error of the Estimate	<i>F</i>	<i>Sig.</i>
Musical	-.227	-2.621	.010	.227	.052	.044	5.34	6.87	.010*
Musical	-.304	-3.266	.001	.290	.084	.069	5.27	5.73	.004*
Verbal	.195	2.098	.038						
Musical	-.336	-3.668	.000						
Verbal	.330	3.185	.002	.367	.135	.114	5.14	6.45	.000*
Kinesthetic	-.258	-2.704	.008						

* = significant ($p < .05$)